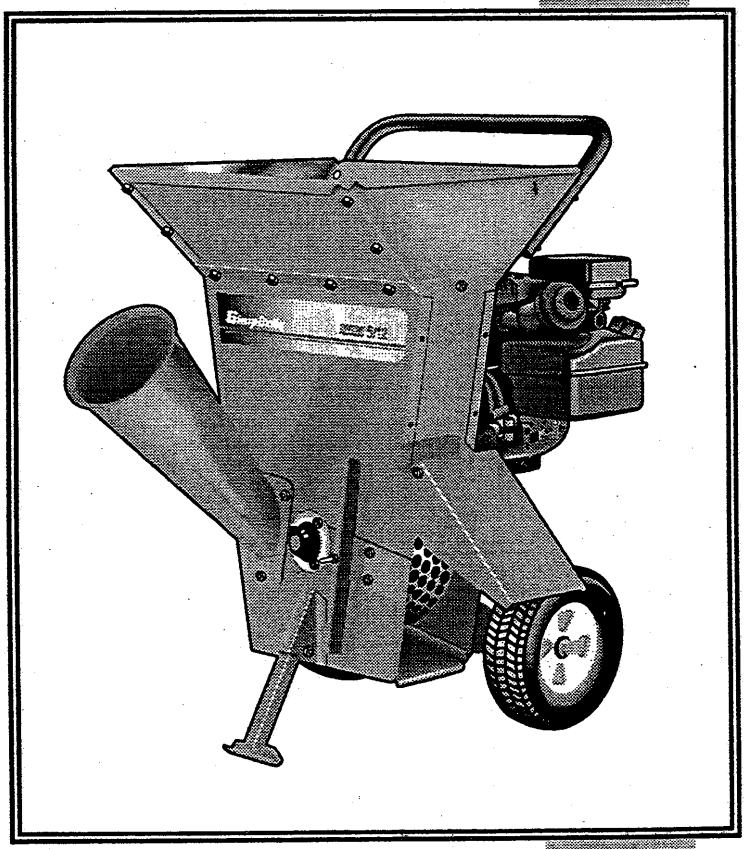
Model 5/12 & 8/12
Mfg. Nos. 1692333 & 1692335

OPERATOR'S MANUAL

Model 5/12 & 8/12
Mfg. Nos. 1692332 & 1692334



Baker™
Chipper/Shredder

Simplicity®

Form No. 1713251-03
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MODEL IDENTIFICATION

Record your model number, manufacturer number and serial number in the space provided for easy reference. The model and manufacturer numbers can be found on the unit I.D. plate. Refer to the Engine Owner's Manual for location of engine serial number.

If you have a service problem requiring special assistance and cannot contact a local dealer to help, call the Customer Service Department at **414-284-8786.**

MODEL REFERENCE

Model Number: _____

Manufacturer Number: _____

Engine I.D. Number: _____

Dealer Name/Date Purchased:

NOTICE

Upon start-up and shut down, you may hear the metal-to-metal sound of the triangular hammers positioning themselves on the rotor. *This is a normal sound.*

If this sound continues after the machine obtains full speed, please contact your dealer for an inspection of your chipper/shredder.

⚠ WARNING

You must read, understand and comply with all safety and operating instructions in this manual before attempting to set-up and operate your chipper/shredder.

Failure to comply with all safety and operating instructions can result in loss of machine control, serious personal injury to you and /or bystanders, and risk equipment and property damage. The triangle in the text signifies important cautions or warnings which must be followed.

Safety Rules

GENERAL

⚠ The Safety Alert symbol shown here is used to alert you to important safety information that must be read, fully understood, and followed at ***all*** times when handling, transporting, operating, servicing, or storing your chipper/ shredder unit.

Each safety alert symbol is followed by a "signal word" that advises you of the relative intensity, or level, of the hazard the safety alert instructions pertain to.

The following list of signal words is being provided to help you understand the intensity levels associated with each signal word used in this manual.

⚠ DANGER

The signal word "DANGER" is used when a serious injury or fatality will result if the safety instructions that follow this signal word are not obeyed.

⚠ WARNING

The signal word "WARNING" is used when a serious injury or fatality could result if the safety instructions that follow this signal word are not obeyed.

⚠ CAUTION

The signal word "CAUTION" is used when personal injury, or property or equipment damage could result if the safety instructions that follow this signal word are not obeyed.

⚠ DANGER

You must read and understand this manual and all safety instructions and labeling completely, before attempting to assemble, set-up, transport, operate, service, or install any options or accessories on this unit.

This chipper/shredder is a powerful machine designed for chipping of tree limbs and branches up to 2-1/2" in diameter (3" on 8 HP Model), and is capable of amputating or causing serious injury to fingers, hands, feet, and other extremities if accidental contact with rotating chipper and shredder blades should occur.

Always keep hands, feet, and other extremities out of the shredder hopper, chipper cone, and discharge area, and never wear loose fitting clothing or jewelry that could get caught on tree limbs, branches, or rotating parts, and pull your hands, or other body parts into the rotating chipper/shredder blades.

Safe operation of the chipper/shredder unit requires that all operating and safety instructions be obeyed by everyone who uses, services, or otherwise handles the unit.

Although the instructions and warnings appearing in this manual cover most normal operating conditions, everyone using the chipper/shredder unit must also always follow safe work practices while operating, servicing, or handling the chipper/shredder unit under any conditions not specifically covered in this manual.

SETTING UP

1. Although most assembly has been done at the factory, your chipper/shredder unit requires minor assembly and the addition of engine oil before it can be used. Never attempt to start or operate the unit unless the chipper cone and shredder hopper have been properly installed and engine oil has been added.
2. Perform the required assembly in an area where the chipper/shredder can be handled comfortably. Never attempt to assemble the unit unless the engine/base assembly can be held or securely positioned for assembly needs.
3. Use proper hand tools for assembling the chipper/shredder. Never use tools such as adjustable open-end wrenches that can slip off hardware as it's being fastened. Never use toothed gripping pliers which may damage hardware and make removal difficult.
4. Always use only the hardware provided with this unit for assembly. Never substitute parts, or mix the proper position of parts during assembly. If a part is missing, contact your local dealer for an exact replacement.
5. Assemble the unit in the sequence indicated in the assembly instructions. Make sure all hardware is properly tightened after assembly is completed and before starting the unit.
6. Make sure all required hardware has been installed. Never attempt to start or operate the unit unless you are sure that all required hardware has been used.
7. Inspect the shredder hopper and chipper cone for any debris, loose hardware, or other material that may have fallen in during unpacking and assembly. Always disconnect the spark plug wire from the spark plug, before removing any objects.
8. Never fill the fuel tank indoors! Gasoline vapors are explosive, and can easily travel unnoticed to sources of ignition, such as pilot lights or open flames on water heaters, furnaces, stoves, or dryers, sparks from electric motors and other electrical appliances,

or unattended smoking materials. Contact with these or any other ignition sources will cause an explosion or fire, serious personal injury, and damage to property and equipment.

9. Never overfill the fuel tank. Fuel may run out of the tank and contact hot surfaces on the chipper/shredder motor and ignite, causing a fire and/or risk of an explosion. Fill fuel tank to 1/2" below bottom of filler neck only.
10. Use only an approved container for fuel, and always handle the container with extreme care. Never smoke while fueling the chipper/shredder or transporting the fuel container.
11. Never store the fuel container or chipper/shredder indoors where there is a possibility of contact with any ignition source such as a spark, open flame, pilot light, heating element, or smoking materials.
12. Never attempt to operate a unit indoors or in an enclosed area. Engine exhaust contains Carbon Monoxide, an odorless, colorless, and tasteless gas. If inhaled, Carbon Monoxide can cause dizziness, nausea, unconsciousness, and brain damage or death if contact is allowed to continue.

OPERATING LOCATION

1. Always operate the chipper/shredder outdoors only, on a firm, level, earthen or grassy area where the unit will be stable and will stay in position. Never attempt to operate the unit on a slope, or on wet or slippery surfaces where you could slip and fall toward the chipper cone or hopper openings.
2. Never operate the chipper/shredder on asphalt, concrete, or other hard or paved surfaces, as material being ejected out of the discharge chute could ricochet, causing injury to you or bystanders in the immediate area.
3. Never operate the chipper/shredder where children, pets, or others who may be unaware of the potential hazards associated with chipping and shredding operations could enter the area unexpectedly and be exposed to these hazards.
4. Never operate the chipper/shredder on rocky or gravel covered surfaces, as this surface debris could enter the unit and cause extensive damage, or be ejected out of the machine with sufficient force to cause a serious injury to you or bystanders.
5. Never operate the chipper/shredder in an area where sparks from the muffler could ignite surrounding brush or flammable materials. See following Fire Hazard Warning!

⚠ DANGER
SPARK/FIRE HAZARD

GAS ENGINES MAY REQUIRE A SPARK ARRESTER FOR SAFE OPERATION

If the engine on this unit is not equipped with a spark arrester and is to be used on any forest, brush, or grass-covered unimproved land, a spark arrester may have to be added to the muffler before using the engine on such land. The arrester must be maintained in effective working order by the operator. In the State of California, the above is required by law (Section 4442 of the California Public Resources Code.) Other states may have similar laws. Federal laws apply on federal lands. See your authorized engine service center for muffler spark arrester options.

SAFE WEARING APPAREL

1. Always wear safety goggles to protect your eyes from flying debris when operating the chipper/shredder. One pair of safety goggles has been provided with the unit for your immediate use. All others in and around the immediate area must also wear approved safety glasses to protect their eyes from flying debris.
2. Wear hearing protection when the chipper/ shredder is to be used for prolonged periods of time, or whenever noise reaches an uncomfortable level.
3. When wearing work gloves, always wear only properly fitted leather work gloves to protect your hands from cuts and scratches caused by tree limbs and branches. Never wear gloves with pull-ties or straps, as these could get entangled with branches and draw your hands into the chipper cone or shredder hopper cutting areas.
4. Never wear loose fitting clothing, hanging jewelry, ties, scarves, or other items that could get caught on tree limbs, branches, or moving parts, and draw your body parts into the cutting areas of the chipper cone and shredder hopper.
5. Always tie up long hair and prevent it from hanging down, where it could become tangled in branches or get caught in rotating parts and pull you into the cutting areas.
6. Even if you are wearing heavy-duty leather work gloves, never, ever place your hands in the chipper cone or shredder hopper while the unit is running. If you must reach in to clear a jam or free up branches, shut the unit off, disconnect the spark plug wire at the spark plug, and carefully remove or clear the jammed material.

Safety Rules

OPERATING SAFETY

1. Always obey the size limitations for tree limbs and branches stated in the Waste Materials Guide portion of this manual.
2. Never leave the machine running unattended. Always turn off the engine, wait for the rotor to come to a complete stop, and disconnect the spark plug wirebefore leaving the area. Always move the unit to a safe storage area when not in use.
3. Always maintain secure footing and solid balance while starting or operating the chipper/shredder. Never lean directly over the machine.
4. Always stand to the side of the chipper cone when feeding tree limbs and branches into the unit, as tree limbs, branches, and harder woods may whip around while being chipped.
5. Always keep hands out of the chipper cone and shredder hopper when feeding materials. Never wrap fingers tightly around branches as you are feeding them into the unit, as a sudden inward surge could pull your hands and arms into the unit.
6. Always stand clear of the discharge area to avoid being struck by ricochets or material being ejected from the machine.
7. Never allow material to build up in the discharge area or shredding chamber, as this may cause new material being fed into the machine to kickback with sufficient force to injure you or other bystanders.
8. Never allow material to build up around the engine during chipper/shredder operation. This could result in a fire, or overheating of the engine.
9. Never attempt to reposition or move the chipper/shredder unit while it is running. Doing so could cause the machine to tip over, and reaching to steady the unit could result in accidental insertion of your hands into the chipper cone or shredder hopper areas.
10. Never continue to operate the machine if it starts making unusual noise or vibration. Shut the engine off immediately, allow the rotor to stop, disconnect the spark plug wire from the spark plug, and do the following:
    - Inspect the unit for any signs of damage or foreign material in the chipping or shredding areas. Remove any solid material that may be preventing the unit from operating properly.
    - Check for loose parts, and loose or missing hardware, and repair or replace as required.
    - Check the oil level in the engine crankcase. See ENGINE OIL LEVEL under Servicing The Chipper/Shredder.
11. Never attempt to clear clogs from the chipper cone, shredder hopper or discharge chute while the unit is running. Always shut the engine off, allow the rotor to come to a complete stop, and remove the spark plug wire from the spark plug before removing excess materials.
12. Never fill the fuel tank while the machine is running or while the engine is hot. An unexpected spillover of fuel could contact a hot surface and ignite, causing fire or explosion. Turn off the engine, and allow the engine to cool before attempting refilling.
13. Never attempt to perform any maintenance, repairs, or attachment of accessories while the unit is running. Always shut the unit off, allow the rotor to come to a complete stop, and remove the spark plug wire from the spark plug before beginning these activities.
14. Never remove guards, deflectors, or warning labels from the unit. If any of these are found to be missing, take the unit out of service until the appropriate repairs can be made. Tag the machine so others do not mistakenly attempt to use it while awaiting parts or repairs.
15. Always make sure that the shredding chamber, shredder hopper, and chipper cone are empty before restarting the unit after it has been idle. Attempting to start the unit with material in these areas could cause the engine starting cord to stop suddenly, injuring your hand and fingers, or toppling the unit over.
16. Never tamper with any engine controls to alter or increase maximum unit running speed. An over speeding condition could cause the engine to overheat, resulting in risk of fire, permanent engine damage, and voiding of your product warranty.
17. Always comply with the engine manual instructions for operating and periodic maintenance requirements. Make sure the oil level is always in the safe zone, and keep the air filter element clean.

TRANSPORTING AND STORAGE

1. Always use the hopper handle and built-in wheels to move the chipper/shredder. Never lift the unit using the fuel tank for support. If the unit must be lifted for vehicular transportation, always use at least two people, and always grip the unit securely using the front leg and hopper handle.
2. If the unit must be tilted for transporting, consult the engine manual for required preparation. Normally, fuel and oil must be drained to prevent dangerous

fuel leakage, and unwanted transfer of the sump oil into the cylinder head area.

3. Always refill the oil sump with the recommended oil before attempting to use the unit again after it has been drained for transportation.
4. Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
5. Always follow the engine manual instructions for storage preparations before storing the unit for prolonged periods.
6. Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.

SERVICE AND MAINTENANCE

1. Always follow recommended engine and chipper/shredder procedures when performing required service and maintenance on the unit.
2. Always use only factory authorized replacement parts when making repairs.
3. Always comply with recommended factory specifications on all settings and adjustments.
4. Only factory authorized service locations should be utilized for major service and repair requirements.
5. Never attempt to make major repairs on this unit unless you have been properly trained and certified to work on large capacity chipper/shredder units. Improper service procedures can result in hazardous operation, equipment damage, and voiding of manufacturer's warranty.

SAFETY DECALS

This chipper/shredder unit has been designed and manufactured to provide you with the safety and reliability you would expect from an industry leader in outdoor power equipment manufacturing.

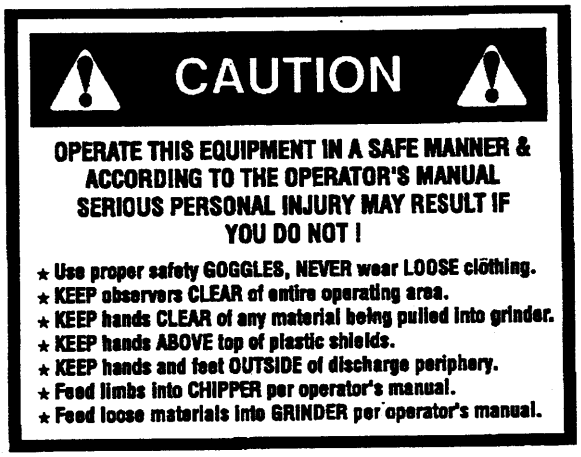
Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the chipper/shredder to remind you of this important information while you are operating the unit.

These important safety labels are illustrated on the right, and are shown here to help familiarize you with the location and content of the safety messages you will see as you perform normal chipping and shredding operations.

Please review these labels now, and if you have any questions regarding their meaning or how to comply with these instructions, reread the complete safety instruction text on the preceding pages, or contact your local dealer.

Should any of these labels become unreadable because of being worn, faded, or otherwise damaged during the use of your chipper/shredder, please use the part number information provided to order a replacement label from your local authorized dealer.

These labels are easily applied, and will act as a constant visual reminder to you, and others who may use the equipment, to follow the safety instructions necessary for safe, effective operation of your chipper/shredder.


CAUTION
OPERATE THIS EQUIPMENT IN A SAFE MANNER & ACCORDING TO THE OPERATOR'S MANUAL SERIOUS PERSONAL INJURY MAY RESULT IF YOU DO NOT !
★ Use proper safety GOGGLES, NEVER wear LOOSE clothing.
★ KEEP observers CLEAR of entire operating area.
★ KEEP hands CLEAR of any material being pulled into grinder.
★ KEEP hands ABOVE top of plastic shields.
★ KEEP hands and feet OUTSIDE of discharge periphery.
★ Feed limbs into CHIPPER per operator's manual.
★ Feed loose materials into GRINDER per operator's manual.

Caution Label
Part No. 5004100 (hopper)

Danger Label
Part No. 5001612 (chipper cone & hopper)
Part No. 1709529 (discharge chute)

Assembly

GENERAL

All of the major assembly procedures on your new chipper/shredder were performed at the factory, and only those items that have been detached or altered for shipping purposes need to be taken care of to make your unit fully operational. These items include attaching the chipper cone and hopper assembly, repositioning the hopper handle to the permanent, normal use position, and adding oil to the engine oil sump.

Estimated time for attaching these easy-to-install parts and adding oil is approximately 30 minutes.

Before beginning your assembly, we suggest you review this manual briefly to help acquaint yourself with the name, location, and function of various chipper/shredder components.

TOOLS REQUIRED

The following standard mechanic's tools are required to perform the necessary assembly:

- ❑ 1/2" Box Wrench or Socket
- ❑ 7/16" Box Wrench or Socket
- ❑ 1/4" Hex Wrench
- ❑ 5/16" Hex Wrench
- ❑ #2 Phillips Screwdriver
- ❑ Hammer or Mallet

HARDWARE DESCRIPTION

All the necessary hardware required to fully assemble this unit is included in the enclosed hardware pack. This universal hardware pack contains the items listed below and possibly additional hardware required for other models:

KEY	DESCRIPTION	QTY.
A	5/16-18 x 3/4 Hex Hd. Bolt	3
B	5/16 Lockwasher	3
C	Push Nuts	3
D	1/4-20 Whiz Nut	18
E	1/4-20 x 5/8 Phillips or Hex Hd. Screw	14
F	1/4-20 x 1-1/2 Phillips or Hex Hd. Screw	4

This hardware is shown actual size in the illustration to the right. Before proceeding with assembly, make sure you have all of the items required, and that you have the correct quantity of each part shown.If you do not, contact your local authorized dealer for assistance.

CHIPPER CONE

1. Remove the protective paper cover over the elliptical chipper hole on the front of the unit.
2. See figure 2. Install the chipper cone over the chipper hole using (3) 5/16-18 x 3/4 hex head bolts and (3) 5/16 lockwashers.

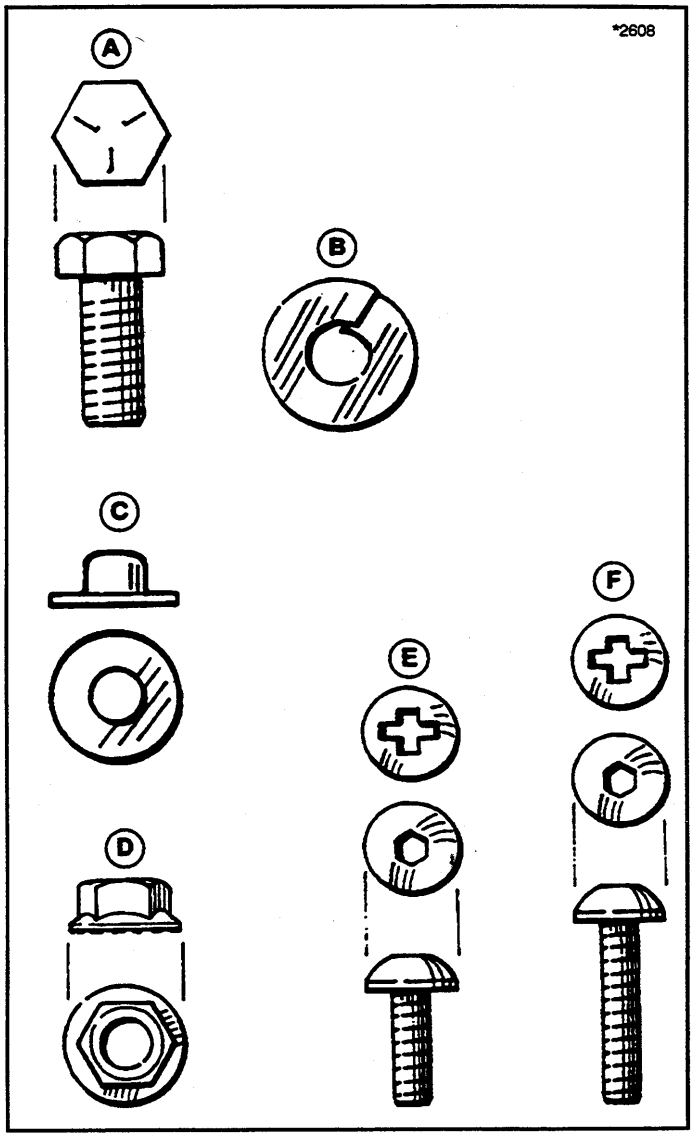


Figure 1. Assembly Hardware

⚠ CAUTION

Failure to install lockwashers in this step will allow the tips of the bolts to contact the rotating chipper knife blades, causing extensive damage to the blades if the unit is started. If you have forgotten the lockwashers, you must remove the bolts and add the lockwashers now.

3. Before tightening these bolts, align the inside diameter of the chipper cone flush with the bottom edge of the chipper hole opening. Support the chipper cone with one hand to maintain flush alignment, then tighten bolts securely.

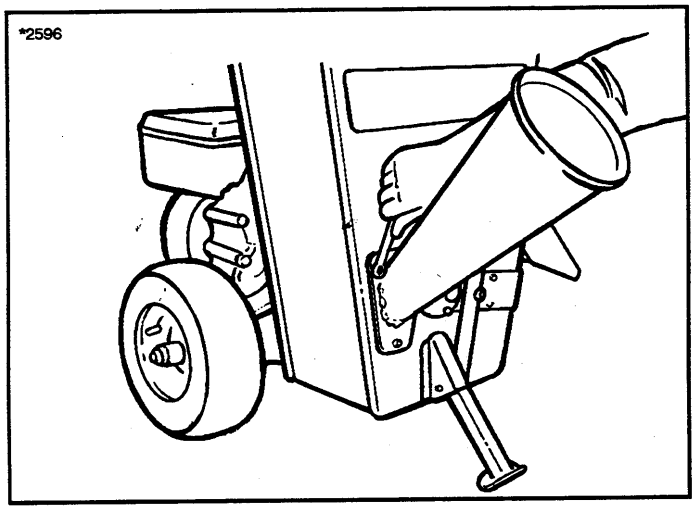


Figure 2. Installing the Chipper Cone

HOPPER & HANDLE

NOTE: It may be helpful to use a Phillips screwdriver to help align the screw holes during the following assembly.

Install all hopper screws with the head on the inside of the hopper.

DO NOT tighten the screws completely until the hopper has been fully assembled.

1. Install the hopper side panels using (1) 1/4-20 x 5/8 screw and (1) 1/4-20 whiz nut per panel. The hopper side panels have one mounting hole at the top and bottom. Install the side panels to the inside of the hopper as shown in figure 3.
2. Position the hopper guard and back panel (panel with two warning labels) to the inside of the rear flange (engine side). Install the hopper guard between the back panel and rear flange, with the black side facing up. Make sure the angled corner of the guard is installed against the tapered side of the hopper interior.

   Secure using (4) 1/4-20 x 5/8 screws and (4) 1/4-20 whiz nuts.
3. Attach the hopper front panel and the remaining hopper guard to the inside surface of the front flange using (4) 1/4-20 x 5/8 screws and (4) 1/4-20 whiz nuts.
4. Attach the hopper front panel to the hopper end panels using (4) 1/4-20 5/8 screws and (4) 1/4-20 whiz nuts.
5. Attach the handle to the hopper back and side panels using (4) 1/4-20 x 1-1/2 screws and (4) 1/4-20 whiz nuts as shown in figure 6.

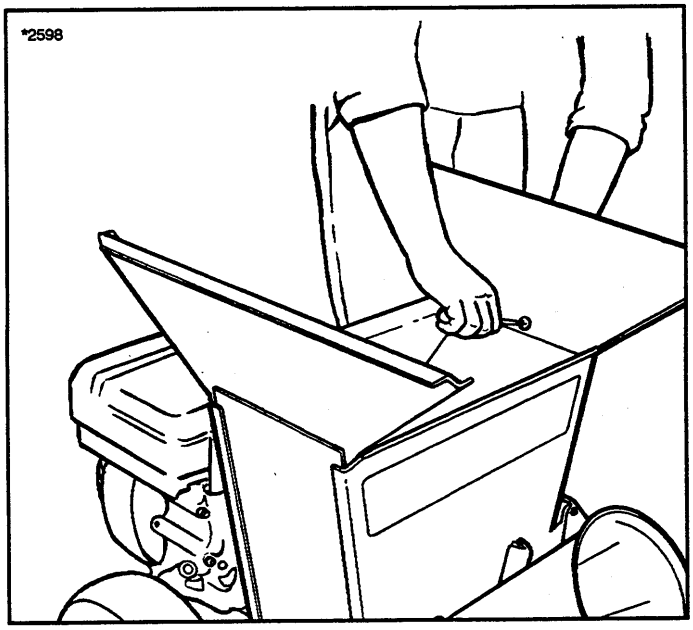


Figure 3. Installing the Side Panels

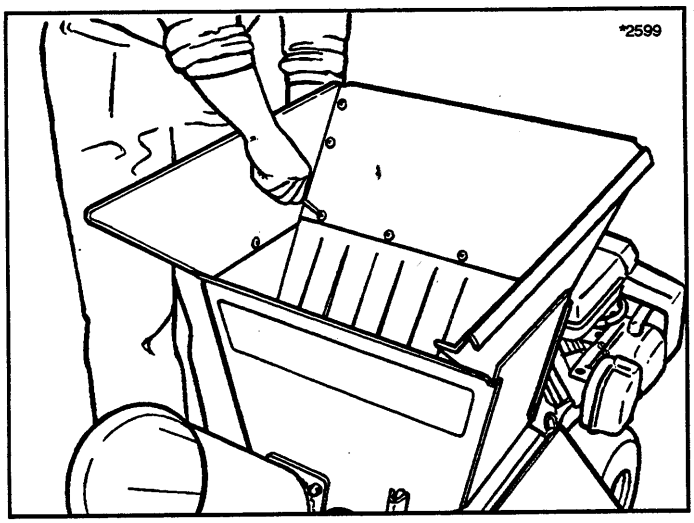


Figure 4. Installing Back Panel and Guard

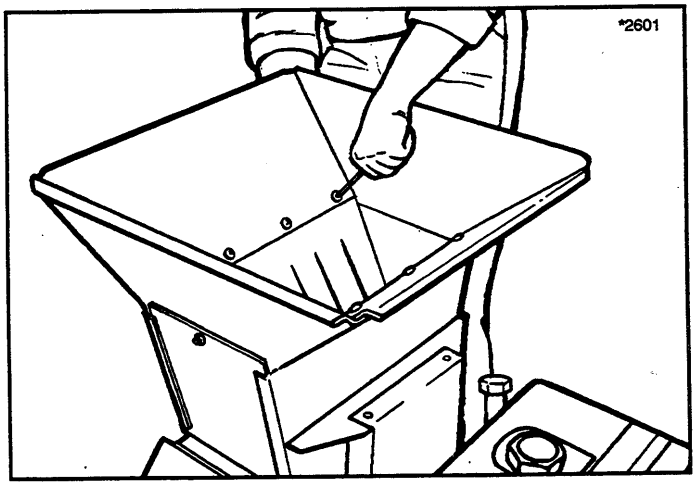


Figure 5. Installing Front Panel

6. Tighten the hardware securing the bottom of the panels to the hopper flanges. Make sure panels are properly aligned as you perform this step. Tighten all other hardware securely.

DISCHARGE DEFLECTOR

CAUTION

Before installing the discharge deflector, remove the discharge screen and check to ensure that both chipper knives have not loosened during shipment. Also, inspect the shredder area for any loose hardware or other objects that may have fallen in. See the instructions below.

1. Disconnect the spark plug wire from the spark plug.
2. Remove the 1/4-20 whiz nut holding the rod holder in place. See figure 7.
3. Hold the discharge screen with one hand and slide the top and and bottom screen rods out to release the screen.
4. Set the screen aside and rotate the rotor assembly to position the first chipper knife near the discharge chute opening.
5. Check the chipper knife mounting screws for tightness using a 5/16 hex wrench and tighten as required. Rotate the rotor and repeat the step for the other chipper knife. See figure 8.
6. Visually check the shredding chamber for any loose hardware or other objects that may have fallen in, and clean as required.

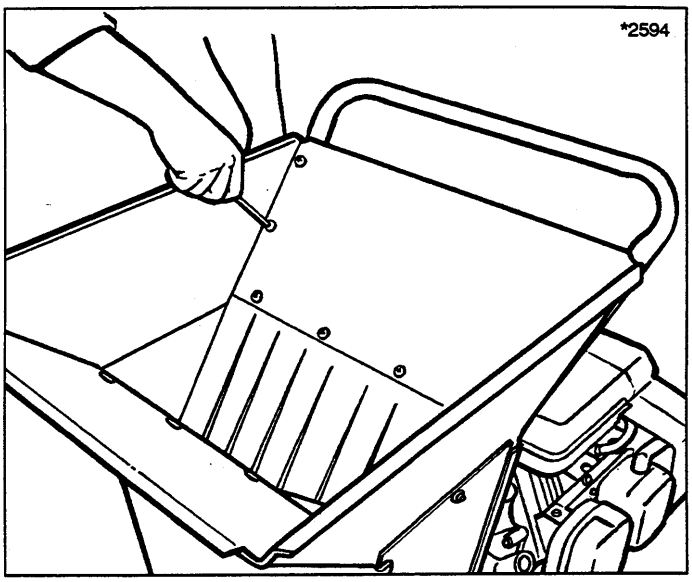


Figure 6. Installing Handle

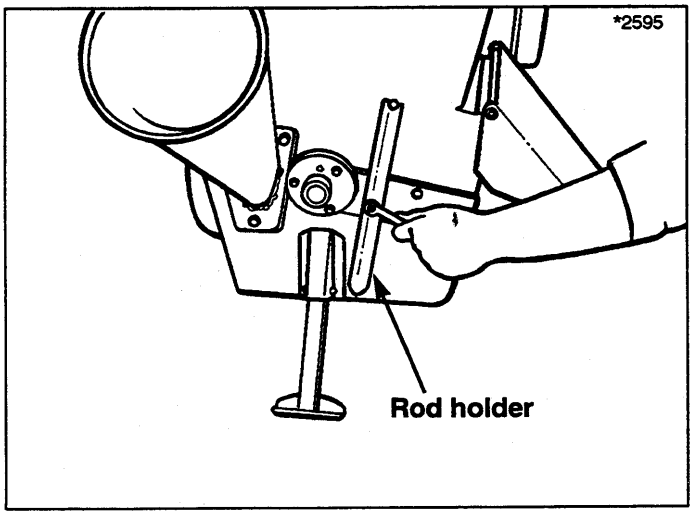


Figure 7. Removing Rod Holder

7. Hold the discharge screen in place. Align the rod holes with the holes in the chipper/shredder panel and insert the top and bottom rods. Make sure both rods are properly inserted in the screen.
8. Install the rod holder over the threaded stem and secure with (1) 1/4-20 whiz nut as shown in step 7.
9. Install (1) 1/4" push nut on one end of the discharge deflector rod by tapping it onto the rod with a hammer.
10. Position the discharge deflector in place over the discharge chute. Insert the rod through the mounting holes in the deflector and shredder chamber. Tap the other push nut onto the end of the rod.

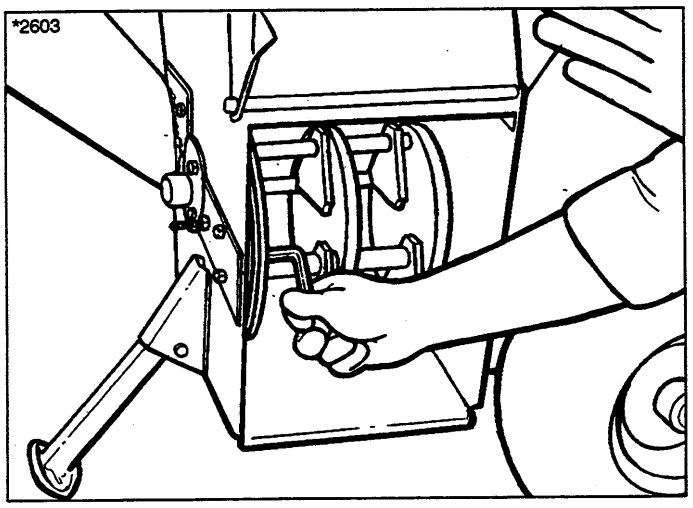


Figure 8.Checking Chipper Knife Mounting Screws

ENGINE OIL

Fill the engine oil sump with SAE 30 oil (5W30 for winter use). See page 19 for additional information and the location of the fill-plug, or consult the engine manufacturer's literature shipped with your chipper/shredder.

Controls & Major Components

OPERATING CONTROLS

Your new chipper/shredder has been designed for both ease of use and lasting reliability, and features a simplified control system that requires just two operating controls.

These two operating controls, the **Choke** and the **Throttle,** are conveniently located on the chipper/shredder engine where they can be easily adjusted to start and run the unit under a variety of operating conditions.

Choke

The choke controls the fuel to air ratio, and helps make cold starts easier by providing a rich, easily ignited fuel mixture.

Throttle

The throttle controls engine speed, and allows you to conserve fuel when idling, or to run the unit at maximum speed for optimal chipping and shredding performance.

MAJOR COMPONENTS

The major components of your Chipper/Shredder are:

- Shredder Hopper
- Discharge Chute
- The Support Leg & Wheels
- Rotor Housing
- Engine
- Chipper Cone
- Shredding Hammers
- Chipper Knives
- Screen

Each of these major components serves a specific function on the chipper/shredder. Please take a moment and familiarize yourself with the name, location, and function of these components so that you will better understand the safety and operating instructions provided in this manual. See figure 9.

A. Shredder Hopper

The durable, low-profile design of the shredder hopper makes shredding convenient, yet holds a full size load of material for maximum processing capability.

B. Discharge Chute

The discharge chute ejects the material out of the chipper/shredder, delivering processed materials to a specific area. The pivoting deflector shield directs debris down, while allowing soft materials to be ejected freely from the machine.

C. The Support Leg And Wheels

The sturdy support leg and wide-track wheels give your chipper/shredder a stable, 3-point stance, allowing solid positioning on virtually all surfaces. The large wheel diameter and durable rubber tread design make transporting the unit easy, and the low center of gravity helps prevent tipping while moving over bumpy or uneven terrain.

D. Rotor Housing

This housing assembly contains the chipper knives and shredding hammers that process the materials you'll be chipping and shredding.

E. Engine

The rugged, four-cycle air-cooled engine provides all the power necessary to readily chip or shred a wide variety of materials. Read the engine manufacturer's manual, which has been provided with your unit, for additional important information.

F. Chipper Cone

The rugged chipper cone helps guide tree limbs and branches directly into the chipper knives, and it's unique angled mounting helps pull the material in quickly for aggressive chipping action.

G. Screen

The screen keeps material in the shredding chamber until it has been thoroughly shredded. A variety of screens are available for different size mulch.

Shredding Hammers (Not shown)

The unique design of the patented free-swinging, triangular shredding hammers and "J" hammers helps pull material into the shredding chamber, and increases volume-reduction efficiency more than most other brands.

The revolutionary design of these triangular hammers provides more shredding power than conventional fixed rectangular hammers, and since they can be rotated, their 6 different useable cutting edges help extend service life dramatically.

Chipper Knives (Not shown)

Our chipper/shredder line also features high quality, precision-tempered, solid steel chipper knives, which can be sharpened again and again to extend their useful life for many seasons to come.

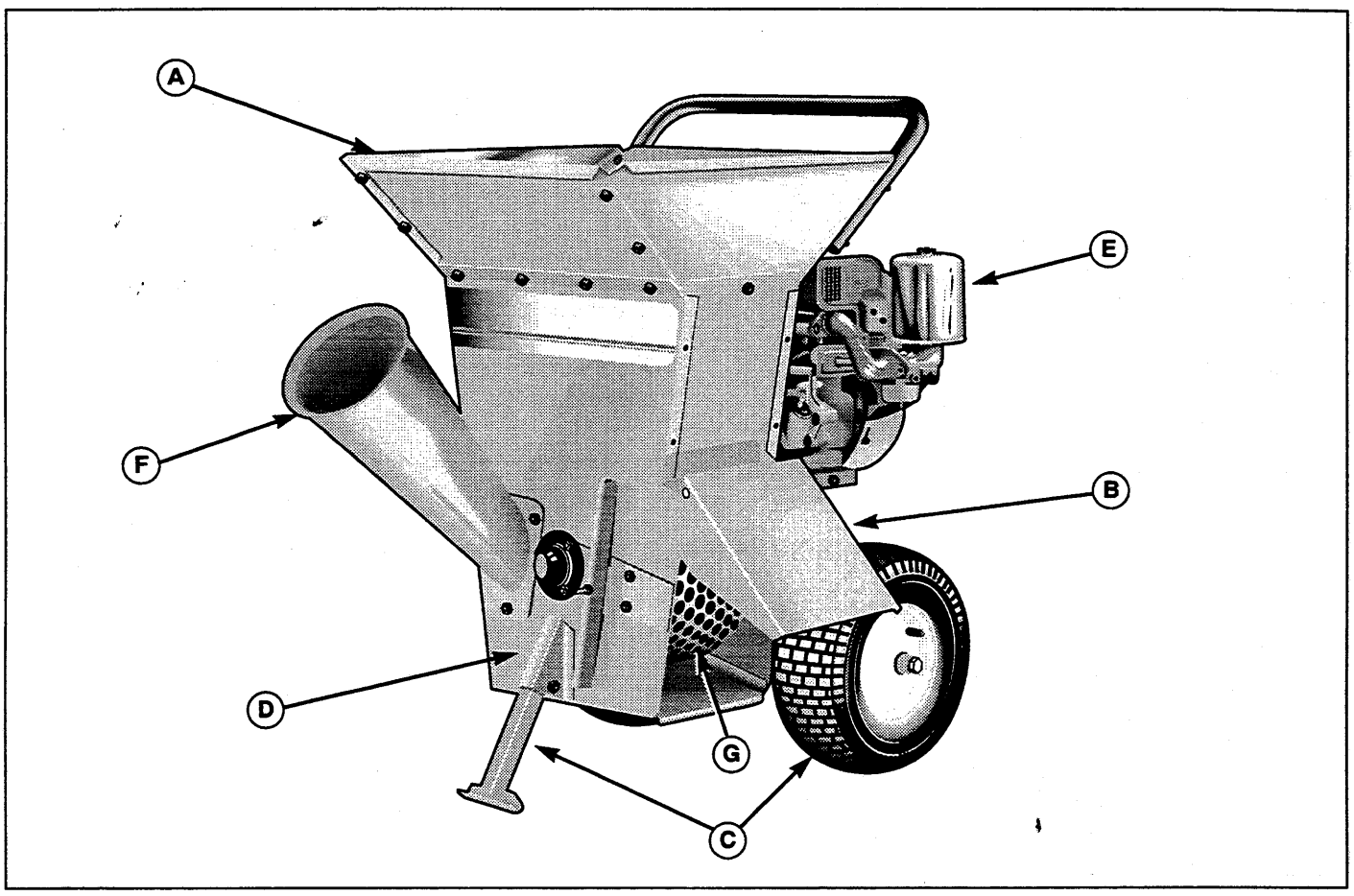


Figure 9. Component Location

MODEL SPECIFICATIONS

SPECIFICATIONS	MODEL 5/12	MODEL 8/12
Horsepower	5 H.P.	8 H.P.
Chipping Capacity	3"	3"
Chipping Knives	2	2
Shredding Hammers	8 - Triangular	12 - Triangular
Shredder Capacity	3/4 x 18" Long	3/4" x 18" Long
Waste Reduction Ratio	Up to 20:1	Up to 20:1
Weight	133 lbs.	187 lbs.
Optional Equipment	Screens* Tow Bar	Screens* Tow Bar

* See Waste Material Guide for sizes and uses.

Operation

DESCRIPTION

General

Your new chipper/shredder is designed to permit years of trouble-free operation while handling a wide range of chipping and shredding needs.

To help you get the most out of your investment, as well as to help you understand how the unit works, this section explains the basic operation of the chipper/ shredder.

Chipper Operation

The chipper is designed to handle tree limbs and branches up to 3" in diameter. The powerful motor and durable chipping knives also permit the unit to process tough organic matter such as corn stalks and berry canes.

Tree limbs and branches are inserted "butt end" first into the chipper cone, and are fed into the chipper block, where two chipper knives mounted on a heavy duty rotor rotate at 3600 rpm. The sharp cutting edges and angle of the blades actually pulls the tree limbs and branches into the chipper block, cutting the wood into small chips, and promoting rapid material processing.

The chips of material then pass through a slot in the rotor behind the chipper knives, where they are shredded until the material is reduced in size and passes through the discharge screen and out of the discharge chute.

Shredder Operation

The shredder is designed to shred light brush, leaves, and other soft but bulky organic waste. As this material is loaded into the shredder hopper, it is pulled into the path of patented swinging triangular shredding hammers.

The hammers cut and grind the waste into progressively smaller pieces, and air flow then conveys the reduced waste out of the discharge chute.

Because of this unique swinging hammer design and triangular shape, the chipper/shredder has more shredding power than conventional rectangular shredding hammers used by others.

SITE LOCATION

1. Select an area with firm, level ground, covered by dirt or grass. Do not operate on wet, slick surfaces, or in areas with heavy pedestrian traffic.
2. Locate the unit near the waste materials to be processed to reduce lifting and carrying.
3. Trim and stack the materials for more efficient and safe operation of the chipper/shredder unit.
4. Provide sufficient room for maneuvering around the chipper/shredder. Never set up the work area so that operators must over-reach or have to step over materials to be processed.
5. Plan and observe a 6' radius "Safety Zone" around the discharge chute. See figure 10. This "Safety Zone" is the minimum area needed for safe discharge of processed material, and must be avoided by operators and all others whenever the unit is running.
6. Review all operating safety instructions before proceeding.

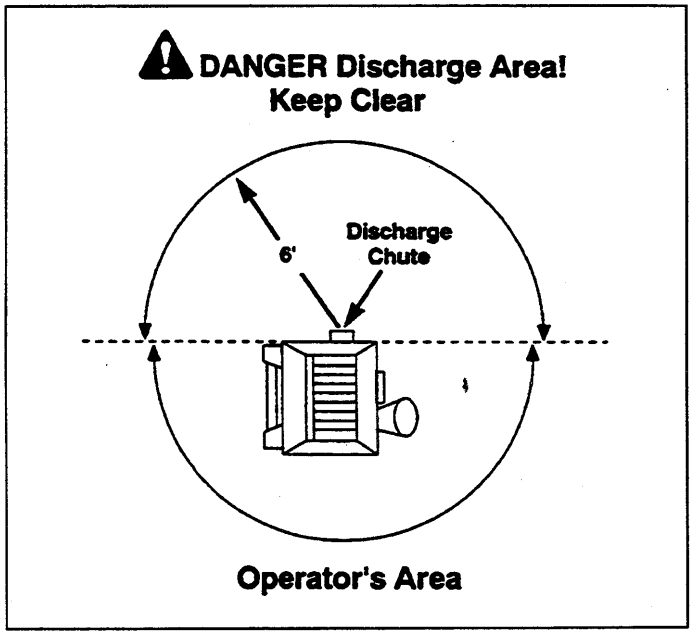


Figure 10. Discharge Area

⚠ DANGER

Internal combustion engines produce Carbon Monoxide, a colorless, odorless, and tasteless gas that can cause dizziness, nausea, unconsciousness, and even brain damage or death if inhaled for prolonged periods.

Operate the chipper/shredder outdoors in a well ventilated location only.

Keep children, pets, and bystanders away from the operating and discharge areas.

Failure to follow these instructions may result in serious injury or death to you or bystanders.

CHECKS BEFORE STARTING

1. Inspect the chipper cone and shredder hopper for debris and other objects that may have fallen into the machine while the unit was idle, and remove them before starting the unit. Before reaching into the openings, always disconnect the spark plug wire at the spark plug.
2. Inspect the chipper cone and shredder hopper, and make sure that they are firmly attached to the housing.
3. Check all parts to ensure that they are properly attached and that all fasteners are properly tightened.
4. Make sure the discharge chute deflector pivots freely allowing mulch to be discharged freely. If the deflector does not pivot, loosen the mounting screw slightly to reduce tension on the pivot point.
5. Before attempting to start the engine, make sure:
   - oil level in engine is full,
   - no fuel has spilled onto engine or surrounding components,
   - all hardware and parts are properly secured.
   - no foreign objects are in chipper cone or shredder hopper,
   - your clothing is not excessively loose or hanging down, and you are not wearing jewelry or other articles that could get caught in the machinery.

START-UP

The controls required to start and run the chipper/ shredder are located on the engine and are marked "Choke" and "Throttle".

A more detailed description of engine operation and all related precautions and procedures can be found in the engine manufacturer's manual that accompanies each chipper/shredder.

Cold Starts

1. Move choke lever to full choke position.
2. Move throttle lever to "start".
3. Place foot on front support leg to hold unit firmly in place, and adopt a stable stance.
4. Pull starting rope out slowly one time and allow to return normally.
5. Pull starting rope out rapidly, and allow rope to return normally.
6. When engine starts, gradually move choke lever to "no choke" position and increase throttle speed.
7. Adjust throttle speed to "high" for best chipper/shredder action.

Restarting A Warm Engine

Restarting an engine that is already warm from previous running may require use of the choke.

1. Move throttle lever to "start" position and move choke lever to 1/2 choke position.
2. Place foot on front support leg to hold unit firmly in place, and adopt a stable stance.
3. Pull starting rope out rapidly until engine starts. Allow rope to return normally.
4. When engine starts, gradually move choke lever to "no choke" position and increase throttle speed.
5. Adjust throttle speed to "high" for best chipper/shredder action.

Idle Speed

Use the "low" position on the throttle lever to reduce stress on the engine when chipping or shredding is not being performed. Lowering the engine speed to "idle" the engine will help extend the life of the motor, as well as conserve fuel and reduce the noise level of the equipment.

Operating Speed

For normal chipping, shredding, and vacuuming operation, set the throttle lever to "fast".

OPERATING INSTRUCTIONS

General

Your chipper/shredder is easy to set up and operate, but requires simple precautions that are very important, but easy to follow.

Please review the following instructions and illustrations carefully. Always comply with these and all other safety and operating instructions in this manual, and on warning labels on the chipper shredder unit, whenever handling or operating this machinery.

Always wear safety goggles when operating the chipper/shredder. Never allow anyone to operate the unit or remain in the immediate area unless they are wearing approved safety goggles.

Proper Stance For Chipping

Always maintain a stable, well-balanced stance to one side of the unit when operating the chipper/ shredder. Never stand directly in front of the chipper cone when performing chipping operations, since occasional kickbacks may occur, and result in you being struck by the tree limb or branch being kicked back. Hold tree limbs

Figure 11. Proper STance for Chipping

Figure 12. Feeding Materials For Shredding

and branches carefully to maintain control as they are being fed into the chipper cone, letting the self-feeding action of the unit pull the material in.

Never wrap your fingers around tree limbs and branches so tightly that you can't let go quickly if the tree limb or branch is suddenly pulled into the chipper block or shredder hopper area.

Leaves and other lightweight organic matter can be quickly shredded in your chipper/ shredder and reduced up to 1/20th of their original volume. Place material to be shredded into the shredder hopper. Avoid large amounts of wet material that can cause shredded matter to build up in the discharge chute and prevent proper discharge. Alternate the processing of dry and wet materials to help prevent clogging of the discharge chute. When time permits, let wet material dry out for a few days prior to shredding.

Properly Feeding Longer Materials For Shredding

When processing brush, small branches, or other long types of organic matter, feed the materials to be shredded into the shredder hopper lengthwise, butt end first, to prevent clogging of the hopper. If brush gets tangled and clogged as it's being fed into the hopper, never reach into the hopper to clear it while the unit is running. Shut the engine off, let the rotor come to a complete stop, and disconnect the spark plug before attempting to clear the hopper.

NOTE: Be sure to shut off the engine and allow the rotor to stop completely before emptying the bag.

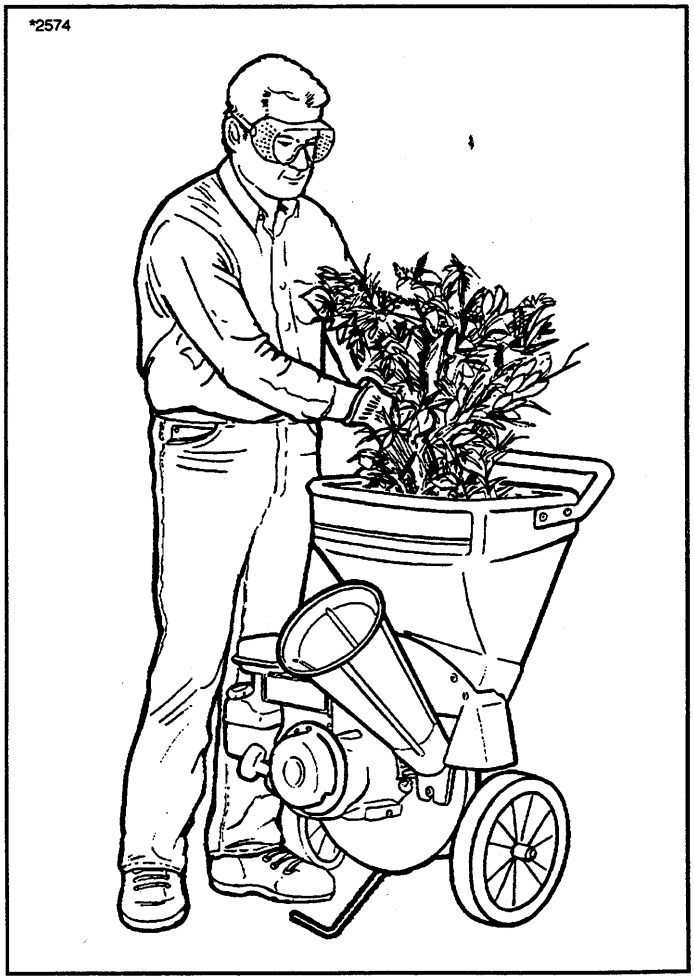


Figure 13. Properly Feeding Longer Materials for Shredding

DIRECT BAGGING

⚠ WARNING

Always shut the unit off, let the rotor come to a complete stop, and disconnect the spark plug wire whenever attaching or removing the bag, or when repositioning material to the bottom of the bag. Never handle or reach into a bag while the unit is running.

Failure to obey these instructions may result in severe personal injury.

Your new chipper/shredder model offers the additional convenience of direct bagging of shredded waste. There are two methods of direct bagging described on this page.

NOTE: If local regulations require the use of paper bags for lawn and garden refuse, either method can be used with paper garbage bags. Use extra care to avoid tearing the bag when positioning it on the chipper/shredder, and when lifting the bag to redistribute material to the bottom.

Method One

1. Place a 30 gallon, heavy duty plastic garbage bag over the discharge chute opening and secure it with a piece of string or large rubber band.
2. Secure the bag so the upper portion over the discharge chute remains open. This will allow air to escape during operation.
3. Shut the unit off periodically as the bag begins to fill, and lift the bag slightly so that the discharge material falls backward toward the bottom of the bag.

Method Two

1. Place a 30 gallon, heavy duty plastic garbage bag over the discharge chute opening with about half the length of the bag covering the chute and deflector.
2. Pull the other side of the bag opening under the unit so that the top of the bag is pulled tight against the discharge chute. Place a tree limb, brick or other suitable heavy object on the bottom of the bag to keep it taut.

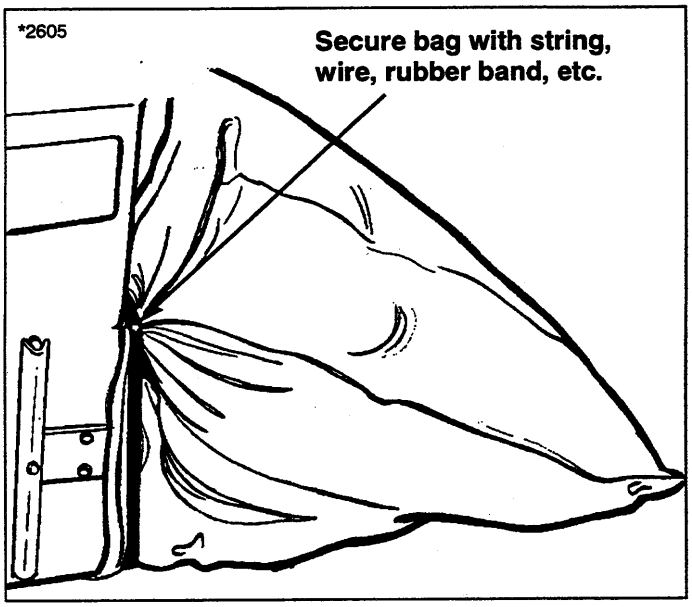


Figure 14. Bagging Method One

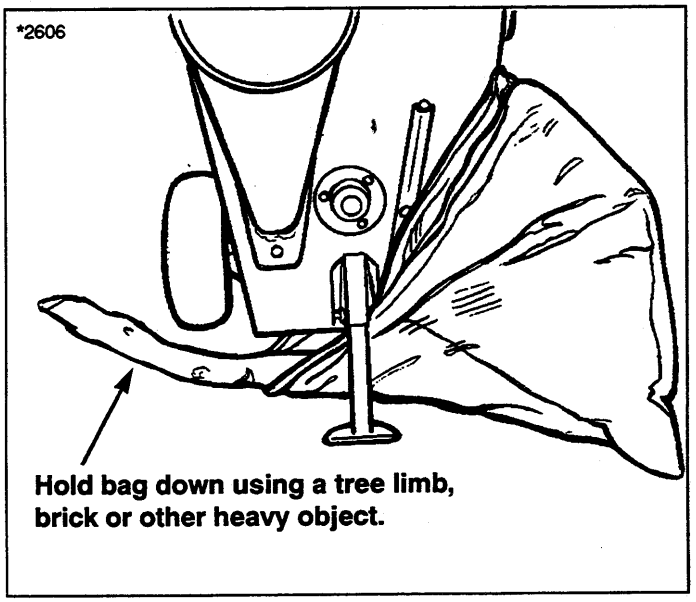


Figure 15. Bagging Method Two

3. Shut the unit off periodically as the bag begins to fill, and lift the bag slightly so that the discharge material falls backward toward the bottom of the bag.

MATERIAL PROCESSING

General

Most materials to be processed can be handled more efficiently by observing the following chipper/shredder operating tips:

Shredding

1. Don't overload the shredder hopper by dumping large volumes of material into the hopper opening.
2. Alternate wet and dry material to prevent the discharge chute from becoming plugged.
3. Never use any object to force material into the shredder chamber. It could get caught in the shredding hammers and damage the unit, reducing shredder hammer effectiveness.

Chipping

1. Prune tree limbs and large branches to limit size to the maximum diameter allowed. Pruning tree limbs and branches close to the main portion of the limb or branch will make feeding into the chipper cone easier, and will help you maintain control as the material is drawn into the chipper block.
2. Large, hard, or dried-out tree limbs that tend to resist chipping can be processed by rotating them manually as you alternately insert and retract them in the chipper cone.
3. If the material to be chipped is extremely hard and kicks back forcefully, or cannot be easily controlled while it is being fed into the unit, remove the material immediately and set it aside. You may need to sharpen the chipper blades to process the material. Consult the maintenance and service section of this manual for sharpening instructions, or take your unit to an authorized service center for prompt, reliable service.
4. If normal chipping operation begins to require additional feeding force to process material, the chipper knives may be in need of routine sharpening. See the maintenance and service section of this manual for sharpening instructions, or take your unit to an authorized service center for prompt, reliable service.
5. Always try to maintain adequate control of the tree limbs and branches being fed into the chipper cone to prevent them from whipping around and causing injury to you or damage to the cone. Larger limbs and branches may have a tendency to kick back toward the operator, so always be alert as you feed materials into the cone.
6. Cut any left-over material into 1" pieces and process them through the shredder hopper.

SHUTTING DOWN

⚠ DANGER

Engine and surrounding parts become extremely hot during normal use, and will cause serious burn injuries if touched before the engine has cooled.

Allow engine to cool completely before touching these hot surfaces.

When you're done using the chipper/ shredder, following these simple but worthwhile steps will help you shut down the unit properly so that your next use will be trouble-free.

1. When you have completed processing the materials to be chipped or shredded, shut the engine off and allow the rotor to come to a complete stop before proceeding.
2. Remove the spark plug wire from the spark plug to prevent the possibility of inadvertent starting.
3. Inspect the following areas for any remaining materials that may have built up or become caught during the final chipping and shredding operations:

   - **SHREDDER HOPPER**

     Visually inspect inside of shredder hopper, and remove any material remaining inside.

   - **CHIPPER CONE**

     Visually inspect chipper cone to ensure that there are no pieces of tree limbs, branches, or any other debris remaining inside. Remove and discard this debris.

   - **DISCHARGE CHUTE**

     Lift the discharge deflector, and inspect the chute for clogs or other build up, and remove as required. This area is most likely to require clean out if wet or green organic materials have been shredded.

   - **ENGINE RECOIL STARTER AREA**

     This area of the engine is also the intake for the motor's air cooling fans. Remove any build-up of grass or shredded material that may have accumulated around the intake openings. Use care to prevent build-up from being pushed into the intake area during cleaning.

WASTE MATERIALS GUIDE

Your chipper/shredder is designed to efficiently process a wide variety of organic yard and garden waste materials. To obtain consistent performance, extend the life of your unit, and help ensure safe operation, do not attempt to process non-organic materials, and always follow the material requirements shown in the Waste Materials Guide below.

If you are unsure about processing a material not covered in the guide below, contact your local authorized dealer, or call our Customer Service Department at 414-284-8786 for assistance before proceeding.

If you encounter any difficulties while processing any of these recommended materials, consult the troubleshooting section of this manual for guidance and recommended corrective action.

OPERATION	TYPE OF WASTE PERMITTED	SIZE LIMITATIONS	NOTES
Shredding	Dry, moist, or wet organic material, including leaves, plants, flowers, fruits, vegetables. Dry waste is more easily processed than wet waste. Process at a feeding rate that allows the rotor to keep turning at a consistently high rate of speed.	Branches and twigs up to 1/2" diameter and 18" long. Fruit and vegetable waste that will pass easily into the shredder chamber.	Alternately chip or shred wet, green waste with dry waste to avoid plugging of discharge chute. If time permits, allow wet material to dry out for a few days prior to shredding.
Chipping	Long, thicker tree limbs, smaller branches, or small branches grouped together for ease of handling. Never use the chipper/shredder to chip very hard, dry materials such as kiln-dried dimensional lumber (2x4's, 1x2's, etc.), or other building and lumber yard materials. Never use the chipper/shredder to chip pressure-treated wood products such as landscape timbers, fence posts, or other outdoor building or landscaping lumber products.	Tree limbs and branches, or small groups of branches. Avoid long pieces (over 6') as the outer end can whip in a circular motion and strike you or bystanders, causing personal injuries. Maximum Diameter: Model 5/12 - 3" Model 8/12 - 3"	Bulky tree limbs and branches may need to be pruned close to the main stem to pass through the chipper cone properly. As the material is chipped, short lengths may be pushed into the chipper with another tree limb or batch of branches. Never place hands in chipper cone to feed short lengths of material.
Screen Selection	• General use - dry organic material. • For finely ground pieces - dry organic material. • For larger pieces - moist or wet material. • For larger pieces - moist or wet.	3/4" 3/8" 1-1/2" Round. 1-1/2" Oblong	Standard Optional Optional Optional

Normal Care

SCHEDULE

Your chipper/shredder has been designed and produced by the industry's leading manufacturer of outdoor power equipment to provide you with years of reliable operation.

Keeping your chipper/shredder in top running condition will prolong its life, and help you obtain optimum performance whenever you wish to chip or shred yard or garden waste.

Please read this normal care schedule, and observe these recommended care operating intervals to extend the life of your unit.

Normal Care Procedures - Perform Each Item At Use Interval Shown				
ITEM	**Page**	**5 Hrs**	**25 Hrs**	**100 Hrs***
Check For Loose Parts & Hardware	18	●		
Check Oil Level And Add As Req'd	19		●	
Change Oil	19			●
Change Spark Plug	19			●
Clean Engine Air Intake Area	18		●	
Clean/Oil Air Filter Element	20		●	
Inspect/Rotate Shredding Hammers	20		●	
Clean Cooling Fins	19		●	
Inspect/Sharpen Chipping Knives	20		●	
Lubricate Wheel Axles	21			●
Check All Safety Labels	21			●
Inspect Starter Rope/Handle	21			●
Inspect Chipper Cone	21			●
Inspect Shredder Hopper & Guards	21			●

*Perform required care yearly or at 100 Hour intervals, whichever is less.
Unusual noise or vibration, decreased performance, or engine odor, requires immediate attention.

SERVICING THE CHIPPER/SHREDDER

General

The following information will help you make the necessary checks and perform the procedures required to follow the normal care recommendations made for your chipper/shredder unit.

If you prefer, your local authorized dealer can make these checks and perform the required procedures for you.

Loose Parts And Hardware

Check the following areas, and tighten as required:

1. Chipper Cone & Cone Mounting
2. Shredder Hopper
3. Deflector Shield

Oil Level

1. Oil level must be full.
   a. On 5/12 models, check the oil level by removing drain plug. Oil level should be up to the bottom of the fill plug opening.
   b. On 8/12 models, the engine is equipped with an oil dipstick. Oil level should be between the "Full" and "Add" mark on the dipstick.
2. Add SAE 30 oil (5W30 for winter use) as necessary.
3. Do not overfill the oil sump! Excess oil will result in frothing of oil, reducing the effectiveness of the oil and shortening engine life.
4. After the proper oil level is reached, tighten fill plug (model 5/12) or oil fill cap (model 8/12) in tightly, and clean surrounding area of any spillage to prevent sticking of debris that could fall into engine during next oil check.

Changing Oil

⚠WARNING
Never drain oil immediately after running the chipper/shredder, as it will be hot and could cause burns if allowed to splash onto your hands or body.

Effective lubrication of the engine is critical to the life expectancy of internal engine components. Because of this, engine oil should be changed yearly when the chipper/shredder is used only occasionally, and more frequently depending on the amount of time the chipper/shredder is in use.

1. Drain engine oil by unscrewing drain plug in engine base and letting oil drain into a suitable container.
2. Dispose of used oil by returning it to an oil recycling center or service station with a oil recycling tank.
3. After all old oil has been drained, screw drain plug in securely, and add oil as instructed in the "Oil Level" section, or see the engine manufacturer's manual for complete details and oil specifications.

Changing The Spark Plug

An annual spark plug change is an inexpensive preventive measure that can help keep your unit running properly throughout the year Check the engine manual for proper spark plug recommendation.

1. Disconnect the spark plug wire from the spark plug.
2. Clean the area around the spark plug to remove debris that could fall into the engine when the plug is removed.

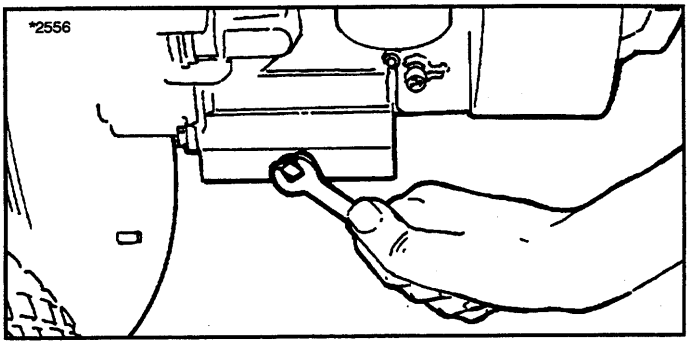


Figure 15. Engine Oil Drain Plug

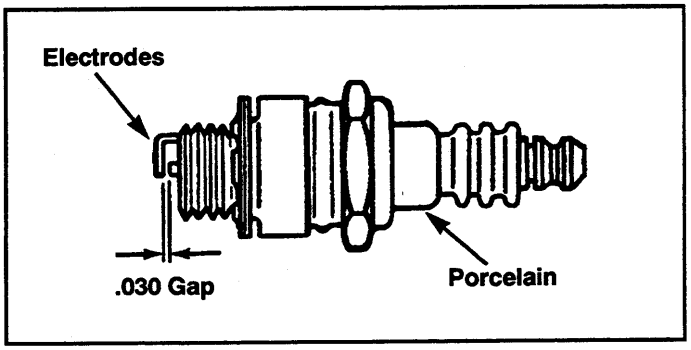


Figure 16. Spark Plug Gap Setting

3. Using a spark plug socket and appropriate wrench, unscrew the spark plug from the engine.
4. After first setting the proper gap on the replacement spark plug, screw the new plug in and tighten. Don't over tighten, as this could crack the porcelain insulator and ruin the plug.

Clean Engine Fins/Air Intake Area

The engine that powers this chipper/shredder is air-cooled, and requires unobstructed air flow into and around the engine. For proper engine cooling, the cooling fins on the engine cylinder head area must also be kept clear of chipper/shredder deposits, as well as any other build-up of debris that could prevent heat from radiating away from the engine.

To clean the air intake area, remove any chipper/shredder build up, and then blow out the area using a stream of compressed air. If a compressor is not available, use a stiff bristle parts brush, which is available at most auto parts supply stores.

To clean the cooling fins, brush the area between the fins with a stiff bristle parts brush, and blow out any remaining debris with a stream of compressed air. If the cooling fins are caked with an oily build-up of chipper/shredder debris, using a commercially available engine cleaning aerosol may help loosen and remove the deposits.

If you use such a cleaning product, you must follow all safety and use instructions to prevent damage to the engine components and personal injury to you.

Using a stream of water to clean the engine requires immediate drying of engine components to prevent rusting and possible malfunctioning of the engine's electrical system.

Clean/Oil/Replace Air Filter Element

The engine air filter element filters and removes airborne dirt, dust, and other work site debris from the air before it can enter the carburetor and damage sensitive fuel passages.

Depending on the type of air filter element installed on your chipper/shredder engine, you should periodically perform one of the following steps:

- clean and oil the air filter (foam filter only),
- only clean the air filter (Type "A" filter),
- or replace the filter every year or 100 hours of operation (paper filter element).

Consult the engine manufacturer's manual provided with your chipper/shredder for the specific instructions that apply to your unit.

If you have any doubts about what type of filter element you have, consult your local authorized dealer for help in replacing or ordering the correct element.

Inspect/Rotate Shredding Hammers

The patented shredding hammers on this line of chipper/shredders can be easily rotated to provide new cutting surfaces as required.

Triangular hammers can be rotated twice, then flipped over for a total of six sharp, new leading edges.

If the shredding action of the unit seems sluggish, or you notice that shredded material is not shredded as thoroughly as when the unit was new, the shredding hammers may need to be rotated or replaced.

Rotating the shredder hammers requires the following major steps:

1. Removal of the shredder hopper.
2. Removal of the rotor housing.
3. Removal, rotation, and/or replacement of the shredder hammers.
4. Replacement of the rotor housing.
5. Replacement of the shredder hopper.

Consult the Troubleshooting and Repair Section of this manual for complete disassembly, inspection, and replacement instructions.

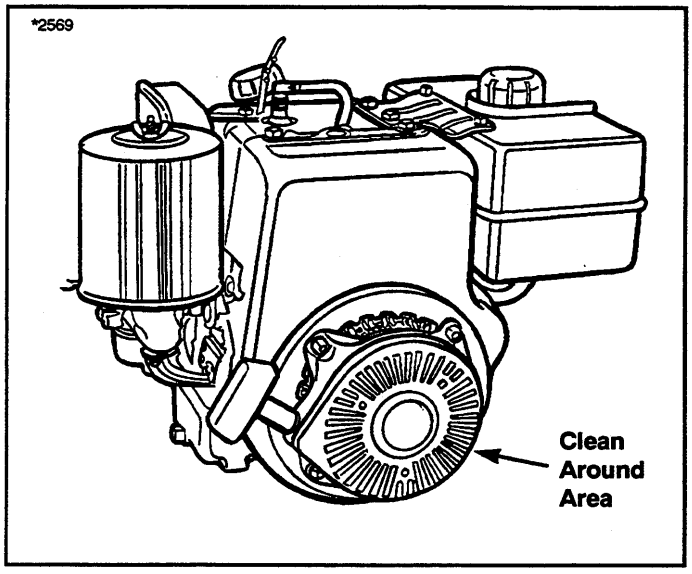


Figure 17. Engine Air Intake Area

Your local authorized dealer can provide this service to you if you don't wish to disassemble the unit and inspect/repair it yourself.

Inspect/Sharpen Chipping Knives

This unit's high-quality chipping knives are manufactured from a high-quality precision tempered steel, and are designed to provide positive feeding of tree limbs and branches, as well as exceptionally long service life.

Normal chipping operations will gradually wear the cutting edges of these blades, but the rugged design and tough material used allows them to be quickly and easily resharpened for long-lasting, like-new performance.

When tree limbs and branches begin to require additional pressure to feed into the chipping knives, it may be time to sharpen the cutting edges to return them to their original performance.

Sharpening the cutting knives requires the following major steps:

1. Removal of the shredder hopper.
2. Removal of the chipper cone.
3. Removal of an access plug.
4. Removal of the cutting knives.
5. Careful, low-speed, wet grinding of a new edge.
6. Reassembly of the cutting knives to the rotor
7. Reassembly of the chipper cone and shredder hopper to the unit.

Consult the Troubleshooting and Repair Section of this manual for complete disassembly, inspection, and replacement instructions.

Your local authorized dealer can provide this service to you if you don't wish to disassemble the unit and inspect/repair it yourself.

Lubricate Wheel Axles

The low profile and excellent balance of the unit makes transporting it easy, but constant exposure to dirt, debris, and chipper/shredder materials requires routine lubrication of the wheels.

To lubricate, squirt 3-5 drops of SAE 30 oil on each wheel axle. Wipe up any run-off and spin wheels briefly to work oil around entire axle.

Check Safety Labels

The safety labels located in various positions on the chipper/ shredder have been placed to help remind you of important safety rules while you are running the chipper/shredder unit.

While these labels are extremely durable, constant abrasion from tree limbs and branches can eventually affect their readability. Check each label to make sure it is still properly affixed to the chipper/shredder, and is still completely legible.

If any label can't be read or is missing, contact your local dealer for an immediate replacement. If you must use the unit without the label, review the label information in the "Safety Labels" section of this manual.

Inspect Starter Rope/Handle

The recoil starter rope and handle should be inspected for signs of abrasion or wear that could result in breakage.

Don't use worn out parts, since they could break while tension is applied to the rope, throwing you off balance.

Contact your local authorized dealer for replacement if these parts need to be replaced.

Inspect Chipper Cone & Shredder Hopper

The chipper cone and shredder hopper are made of a highly durable polyethylene material that can withstand repeated abrasion and impact from normal chipper/shredder waste material processing.

Check these parts to make sure that they haven't been damaged or worn excessively by constant use, and replace them if they are cracked, worn out, or no longer fit securely on the chipper/shredder unit.

Cracks, worn areas, and loose attachment points can cause material to jam or clog when feeding it into the machine, and may result in kick-back or other hazard to the operator.

Contact your local dealer for replacement parts if your unit shows any evidence of these problems, and discontinue use of the unit until the appropriate repairs can be made.

Never try to make temporary repairs yourself, as the repairs could give way during chipper/shredder operation, and expose you and bystanders in the area to risk of injury.

Never attempt to install non-factory parts on your chipper/shredder unit. These parts could appear to fit, but could cause operating and safety problems that might lead to equipment damage and/or injury.

Inspect Hopper Guards

The hopper guards are made of a tough, flexible material that permits easy loading of the hopper, while preventing shredded pieces from being ejected out toward the operator.

The hopper guards must always be intact and properly installed to provide protection from ejected pieces.

If a hopper guard becomes damaged in use, **do not operate the chipper/shredder until the hopper guard can be replaced.**

Contact your local authorized dealer for replacement parts.

Storage

TEMPORARY STORAGE
(30 Days Or Less)

Remember, the chipper/shredder fuel tank probably will still contain some gasoline, so never store the chipper/shredder indoors or in any other area where fuel vapor could travel to any ignition source. Fuel vapor is also toxic if inhaled, so never store the chipper/shredder in any structure used for human or animal habitation.

Here's a quick checklist of things to do when storing your chipper/shredder temporarily, or between uses:

- Store the unit in a location where there's no danger of overhead objects falling into the chipper cone or shredder hopper.
- Keep the unit in an area away from where children may come into contact with it. If there's any chance of unauthorized use, remove the spark plug, and put it in a safe place. Be sure to protect the spark plug opening from foreign objects with a suitable cover.
- Never put the unit away while the engine is still hot from running. Let the engine cool down first to prevent the chance of fire.
- Never try to lift or position the unit in the storage area by holding the fuel tank. Always let the engine and muffler cool completely before allowing yourself to contact these parts.
- If the unit can't be stored on a reasonably level surface, use a block of wood to chock the wheels. Never store the chipper/shredder where it will not be in a stable position.
- Never tip the unit more than 75° from vertical, and never lay the unit down on its side, as this could cause fuel leakage, and/or undesirable oil transfer into the cylinder head and spark plug area. Excessive oil in the cylinder head will prevent unit from starting properly.
- Overhead objects that fall into shredder hopper may cause damage to the unit or serious injury to user and others if not detected before unit is started.

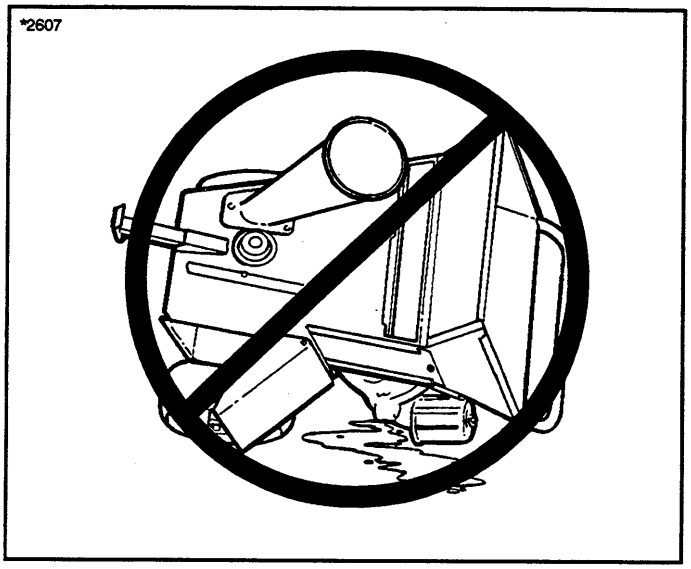


Figure 18. Improper Placement Of Unit

LONG TERM STORAGE
(Longer Than 30 Days)

Your chipper/shredder can be safely stored during off-seasons by following these simple storage instructions:

- Drain fuel system completely following engine manufacturer's instructions or add fuel stabilizer to prevent fuel from gumming up during extended storage period.
- Clean external surfaces, engine and cooling fan.
- Remove spark plug, and squirt 1 ounce of SAE 30 oil into spark plug hole.
- Plug hole and pull starter cord slowly to distribute oil evenly in cylinder head area.
- Reinstall spark plug.
- Transport unit to a suitable storage location. If you have chosen to use a fuel stabilizer and have not drained the fuel system, follow all safety instructions and storage precautions in this manual to prevent the possibility of fire from the ignition of gasoline fumes. Remember, gasoline fumes can travel to distant sources of ignition and ignite, causing risk of explosion and fire.
- Cover chipper/shredder unit to protect shredder hopper and chipper cone from debris and foreign objects.
- If there is any possibility of unauthorized use or tampering, remove the spark plug and store it in a safe place before storing the chipper/shredder unit away. Be sure to plug the spark plug hole to prevent foreign material from entering.

TROUBLESHOOTING

While normal care and routine maintenance will extend the life of your chipper/shredder, prolonged or constant use may eventually require that service be performed to allow it to continue operating properly. The troubleshooting guide below lists the most common problems, causes and remedies.

See the service information on the following pages for instructions on how to do most of these minor repairs yourself. If you prefer, all of these procedures can be performed for you by your local authorized dealer.

⚠ WARNING

Never attempt to perform any of these procedures with the engine running. Always turn the engine off, let the rotor come to a complete stop, and disconnect the spark plug wire from the spark plug before attempting to correct any operating problems.

Failure to comply with this safety requirement can result in serious personal injury to you or bystanders.

SYMPTOM	POSSIBLE CAUSE	REMEDIES
Engine won't start.	• Out of gas. • Spark Plug wire disconnected. • Engine Controls set wrong. • Spark Plug fouled. • No compression - rope pulls• without resistance. • No Spark - Electrical system problem.	• Add gas. • Connect Spark Plug wire. • Check Engine Controls and adjust. • Remove Spark Plug, clean, and replace. • See your local dealer. • See your local dealer.
Engine runs, but rotor won't turn.	• Crankshaft key broken or not installed.	• Replace crankshaft key.
Engine runs, rotor turns, but no material is being discharged.	• Discharge chute clogged. • Engine not running at full RPM.	• Clear discharge chute. • Adjust throttle to "Fast".
Excessive branch vibration when chipping materials.	• Chipper knives dull. • Tree limbs and branches are extremely hard or dried out.	• Sharpen or replace knives. • Material too dried out or hard for chipping - use for firewood.
Unusual noise or vibration when processing material.	• Rotor overloaded with material. • Non-organic matter caught in shredding chamber. • Chipper knives dull or loose. • Hammers, broken, bent, or loose. • Hammers frozen on shaft. • Crankshaft bent.	• Allow unit to clear itself before feeding more material in. • Follow shut-down procedure and remove material from unit. • Sharpen or tighten knives securely. • Check for proper assembly or replace. • Check for obstructions and remove debris from hammer pivot areas. • See your local dealer for factory authorized repair.
Screen damaged by contact. with shredding hammers.	• Oversize material has been put into shredder, distorting screen.	• Replace screen.

REPAIR

Engine Service

Your chipper/shredder engine requires routine maintenance for long life and trouble-free operation. Consult the manufacturer's manual provided with this unit for specific recommendations and service procedures. In general, however, your engine requires only the preventive maintenance indicated on the Normal Care Schedule.

Shredding Hammers

The cutting edges of the shredding hammers may eventually wear out, requiring rotation of the hammer, or complete replacement if all cutting edges have been used.

Triangular hammers can be rotated twice after the first edge dulls, then flipped over once and rotated again for a total of six cutting edges. Shredding hammers need to be rotated when shredding performance becomes sluggish, or when the edges of the hammers wear down, as shown in figures 22.

TOOLS REQUIRED

Rotation or replacement of the shredding hammers requires the use of the following tools:

- 3/16" straight pin punch
- large diameter pin punch (1/4" - 3/8")
- 1/2" box or socket wrench
- hammer

SERVICING THE SHREDDER HAMMERS

⚠ WARNING
Hammer and chipper knife cutting edges are sharp. Wear leather work gloves to protect your hands from injury.

1. Turn engine off, allow rotor to stop completely, and disconnect spark plug wire.
2. Remove the 1/4-20 whiz nut holding the rod holder in place. See figure 19.
3. Hold the discharge screen with one hand and slide the top and bottom screen rods out to release the screen.
4. Using a 1/2" box wrench or socket, remove the 5/16-18 x 1/2 hex bolts that secure the front and back closure plates.
5. Rotate the rotor to position the first of four hammer shafts at the discharge chute opening.

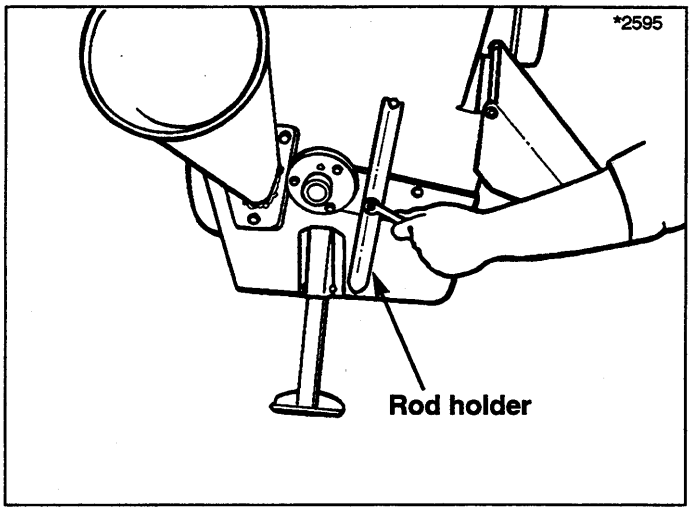


Figure 19. Removing Screen

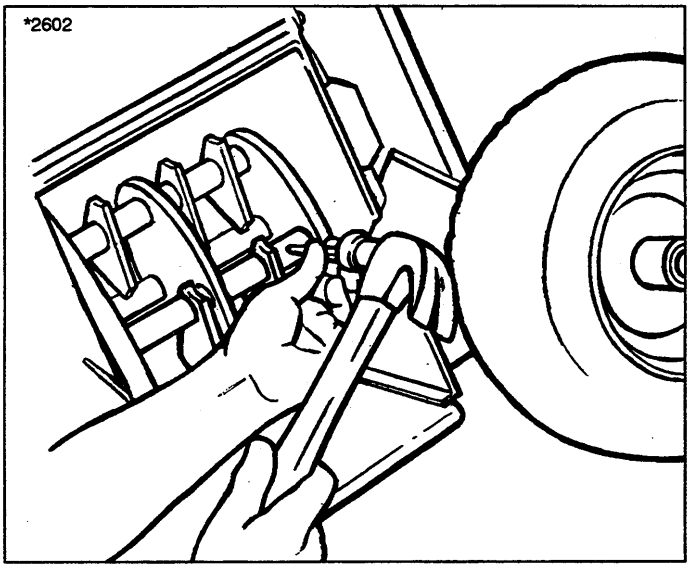


Figure 20. Removing Roll Pin

6. Using a 3/16" pin punch, punch out the roll pin that secures the short spacer to the hammer shaft.
7. Note the position of the hammers and spacers on the hammer shaft to ensure proper reassembly later.

⚠ CAUTION
Incorrect positioning of hammers during reassembly will cause extensive damage to hammers if unit is started.

8. Using a large diameter punch (1/4" - 3/8"), slowly tap the hammer shaft out. See figure 21.

   The hammer shaft must be in line with the openings provided by removal of the front and rear closure plates. As the shaft is tapped out of the rotor, hold the hammers and spacers, and remove them as they become free.

9. See figure 22. Inspect the hammers for wear and rotate or replace as necessary. Replace the hammer if all cutting edges or pivot holes are worn out, or if the hammer is bent, cracked or damaged.

NOTE: Use a new pivot hole if the current pivot hole has become elongated, or utilize a new cutting edge if the current edge is worn out. Flip the hammer to utilize the other side if all cutting edges are worn on the current side.

10. Clean the hammer shaft and inspect it for signs of wear. The shaft should be replaced if:
    - the hammers have worn grooves ,
    - the shaft is cracked,
    - the shaft is bent.
11. Reassemble the hammer and spacers in the order noted during disassembly. See figure 23. Slide the parts onto the shaft as the shaft is tapped back into place on the rotor.
12. Secure the hammers, spacers and shaft using a new 3/16" diameter x 3/4" long roll pin in the short spacer. It may be helpful to start the roll pin by tapping it into the short spacer before installing the spacer on the shaft.

    Do not insert the roll pin beyond the inside wall of the spacer as this will prevent the shaft from entering the spacer during assembly. Make sure the roll pin is aligned with the hole in the shaft before driving it into position.
13. Check for proper assembly position, then rotate the rotor to position the next hammer shaft for removal.
14. Repeat the preceding procedure until all hammers have been repositioned or replaced.

NOTE: If chipping knives are to be inspected or serviced, go to the Chipping Knives section at this time. Otherwise proceed to step 15.

15. Reinstall the front and rear cover plates, shredding screen, rods and rod holder. Tighten all hardware securely.
16. Do not attempt to start unit if extra parts are left over after reassembly. Re-check all hammer assemblies before proceeding.

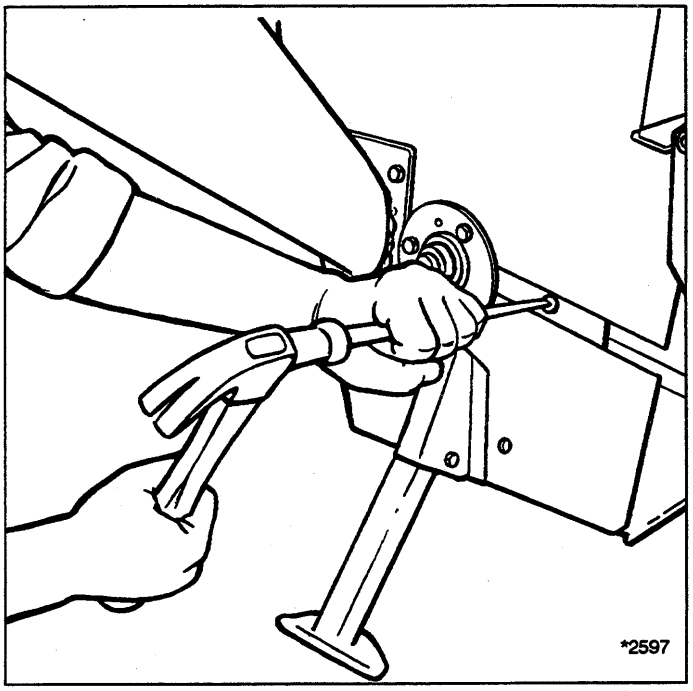


Figure 21. Removing Hammer Shaft

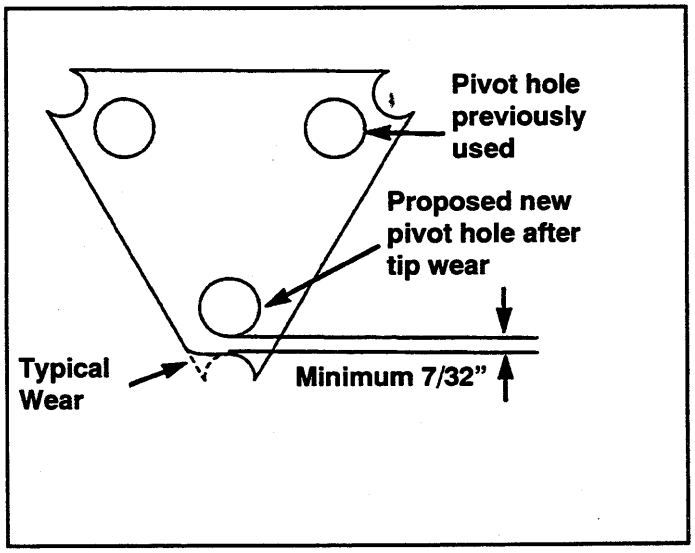


Figure 22. Hammer Wear

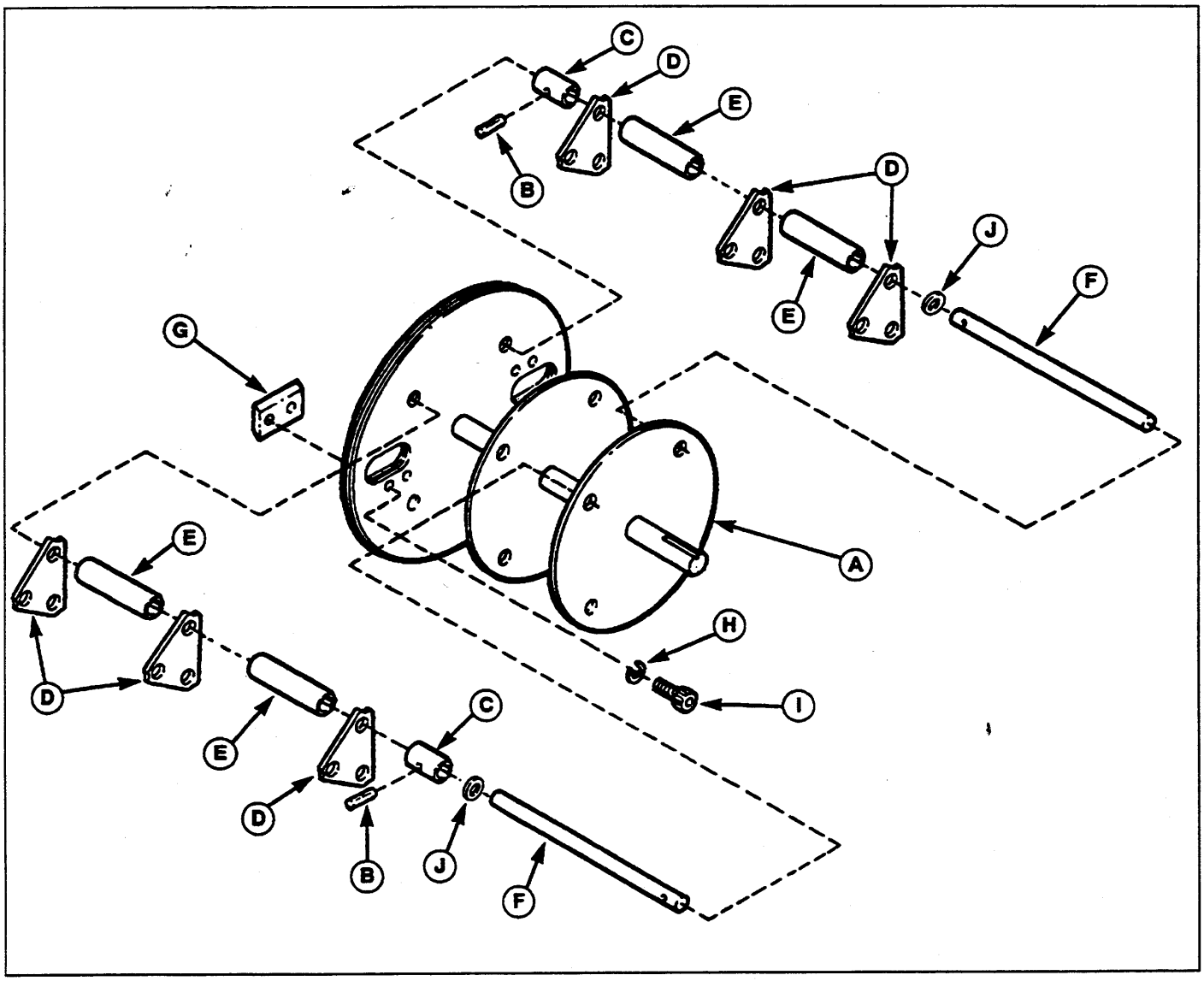


Figure 23. Proper Hammer Assembly

A. Rotor
B. Roll Pin, 3/16 Dia. x 3/4 Long
C. Spacer, short
D. Hammer
E. Spacer, long
F. Shaft
G. Chipper Knife
H. Lockwasher, 5/16
I. Capscrew, 5/16-24 x 7/8
J. Washer

Chipping Knives

Chipping knives signal the need for resharpening or replacement when tree limbs and branches require extra force to feed completely into the chipper cone.

Chipping knives may be resharpened until the distance between the mounting holes and the top corner of the blade bevel is 1/16" apart. See figure 24.

To inspect and service the cutting knives, follow these steps:

1. Turn engine off, allow rotor to stop completely, and disconnect spark plug wire.
2. Remove rod holder, rods and screen. See figure 19.
3. Remove front cover plate.
4. Rotate the rotor to position the first chipping knife in the discharge chute opening. Use a wood block to keep the rotor from turning and remove the knife using a 1/4" hex wrench.
5. Sharpen both knives equally or replace both to ensure proper balancing and correct chipping action.
   - Slow-speed water-cooled grinding is suggested to help maintain blade temper and a long-lasting sharp edge. Rapid grinding and heating of blades will soften the edges, making repeated sharpening necessary.
   - Chipper knives require a 30° bevel on the cutting edge (as shown in figure 24) for efficient chipping action.
   - Contact your local dealer or blade sharpening service if you prefer not to sharpen the blades yourself.
6. Clean the chipper knife mounting areas before reinstalling to ensure a flat mounting surface.
7. Install the new chipper knives using the two capscrews, and two **new** lockwashers. Never reinstall chipper knives using used lockwashers, as used lockwashers may not hold the knives adequately.
8. Reinstall the front cover, screen, rods and rod holder. Tighten hardware securely.
9. Check all hardware for tightness and correct assembly before attempting to start your unit. Do not attempt to start the unit if extra hardware is left over after reassembly is complete. Check for proper chipper knife assembly before proceeding.
10. Test your unit before attempting to use it to perform chipping: Start unit, and check for unusual noise or vibration.
    - Shut unit off immediately if either situation occurs, and re-inspect chipping knives to confirm correct positioning and assembly has been done.
    - If assembly is correct, blades may not have been sharpened evenly, causing an imbalance. Remove blades and sharpen evenly.
    - Recheck unit. If problem persists, contact your local dealer for assistance.

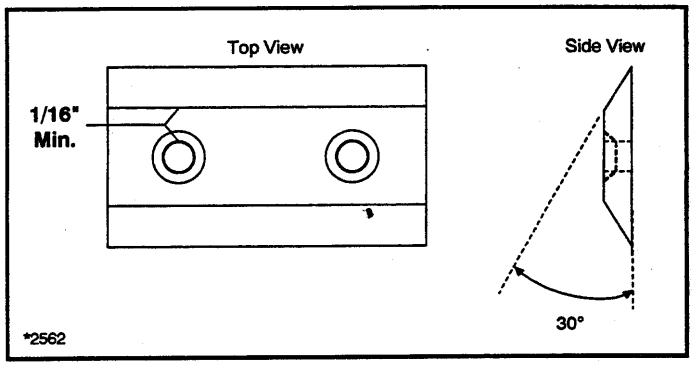


Figure 24. Chipper Knives Minimum Cutting Edge

Deflector Shield

The deflector shield must pivot freely at all times, or processed material could back up, clogging the unit and requiring disassembly to clear.

⚠ CAUTION

Never use a malfunctioning unit to process material, even if it appears to be chipping material adequately. An unexpected kick-back could occur, causing serious personal injury to you or bystanders.

Serious equipment damage could also result, voiding the warranty and requiring extensive repairs by a qualified service location.

OPTIONS & ACCESSORIES

Several optional items and accessories are available that can help increase the usefulness and utility of your chipper/shredder unit:

Screens

Sizes 3/8", 1-1/2" & 1-1/2" Oblong

Tow Bar Kit

Permits chipper/shredder to be towed by a Lawn or Garden Tractor.

TECHNICAL LITERATURE

Parts Manuals are fully illustrated. All of the assemblies are shown in exploded views which show the relationship of the parts and how they go together. Important assembly notes and special torque values are included in the illustrations. For standard hardware, a torque specification chart is included.

Extend Equipment Life
Use Only Genuine Factory
Authorized Repair Parts

For the manual applicable for your model, contact the Customer Publications Department at **(414) 284-8519.** Have the following information available when phoning in your request.

Model: _____

Mfg. No.: _____

Your Name: _____

Address: _____

City, State, Zip: _____

Visa/MasterCard No.: _____

Expiration Date: _____

Allow 3-4 weeks for delivery.

LIMITED WARRANTY (North America Only)

Covered by Warranty

Simplicity Manufacturing Inc. (Simplicity) warrants to the original purchaser that each new product is merchantable and free from defects in workmanship and material.
During the warranty period, any authorized Simplicity Retail Outlet will provide, at no charge, both parts and labor (except as otherwise noted) necessary to correct any defect in workmanship and material.

Warranty Period

Simplicity Chipper/Shredders are warranted for the stated period from the date of the original purchase:

(1) 2 years (90 days if used for purposes other than personal household use).

(2) Repair Parts (parts only, no labor) are warranted for 90 days (45 days if used for purposes other than personal household use). See separate warranty for batteries.)

Repair parts installed on products receive the same warranty period remaining for the product or 90 days (45 days if used for purposes other than personal household use), whichever is longer.

Owner Responsibilities

To qualify for warranty service, the purchaser of a Simplicity product must:

(1) Have sent the Warranty Registration card to Simplicity at the time of purchase.

(2) Notify a Simplicity Dealer as soon as possible after discovery of a possible defect. (If you are not aware of your nearest Simplicity dealer, write for such information to Simplicity Manufacturing Inc., Attn. Service Dept. 500 N. Spring St., Port Washington, WI 53074-0977.)

Not Covered by Warranty

The following are not covered by warranty:

(1) Transportation charges to and from Dealers under Warranty Period.

(2) Damage caused by misuse of the product or by operating the product in excess of recommended capacities: OR

(3) Damage caused by negligence or accident: OR

(4) Products which have been altered or repaired in a manner not authorized by Simplicity.

(5) Engines are warranted separately by their respective manufacturers, except Company agrees to make available to the owners whatever warranty benefits may be made available to the Company by the manufacturers.

(6) Normal maintenance and/or replacement of maintenance and wear items, such as oil, filters, and belts.

(7) Products which have been sold to a second owner.

All implied warranties, except to the extent prohibited by any applicable law, shall have no greater duration than the warranty period for the applicable product. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

The Company's liability arising out of warranties, representations, instructions, or defects from any cause, shall be limited exclusively to repair or replacing parts under the conditions in this warranty, and in no event will Company be liable for incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Simplicity Manufacturing, Inc.
Chipper/Shredder Division
500 N. Spring St. • P.O. Box 997
Port Washington, WI 53074-0997

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